NATIONAL RADIO ASTRONOMY OBSERVATORY

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24 July 2011

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Amendment of Sections 15.35 and 15.253 of	)	ET Docket No. 11-90
the Commission's Rules Regarding Operation	)	RM-11555
of Radar Systems in the 76-77 GHz Band.	)	
	)	
Amendment of Section 15.253 of the	)	
Commission's Rules to Permit Fixed	)	ET Docket No. 10-28
Use of Radar in the 76-77 GHz Band.	)	
	)	

Erratum
National Radio Astronomy Observatory
Charlottesville, VA 22903

1. The National Radio Astronomy Observatory ("NRAO" or "the Observatory") wishes to correct an error in one paragraph of its comment filing in ET Docket 11-90, responding to the Commission's Notice of Proposed Rulemaking FCC 11-79 ("the NPRM") concerning revision of Part 15.253 rules for use of 76-77 vehicular and fixed radars.

2. Specifically the error occurred in ¶9 of the Observatory's filing where the increase in the average emitted power per vehicle was calculated for a fleet of vehicles, a fraction f of which is stopped while in traffic and the remainder (1-f) of which is in motion. While the formula for this quantity in the Observatory's filing is correct in the limits where all vehicles are stopped or all are moving, it is not correct when f is not close to 0 or 1, such that the increase in average power was overestimated. The concerns in ¶9 of the Observatory's filing should be replaced by those in the following paragraph.

2. Consider a vehicle with four radars, one at each end and each side, and all powers given are those measured at 3m from any particular radar. From the table in ¶8 of the NPRM one has that a vehicle not in motion under the old rules may emit an average power of 4 x 0.2 $\mu W/cm^2$, compared to 4 x 88 $\mu W/cm^2$ under the proposed rules, a factor 440 increase. Under the existing rules a vehicle in motion may emit an average power of 60 $\mu W/cm^2$ to the front and 3 x 30 $\mu W/cm^2$ in the other directions, again compared to 4 x 88 $\mu W/cm^2$, a factor of 2.35 increase. If a fraction f of vehicles are

stopped and (1-f) are moving the average power under the proposed rules is 4 x 88 $\mu W/cm^2$ because moving and stopped vehicles may emit the same average power, while under the old rules the average power per vehicle would have been f x (0.8 $\mu W/cm^2$) + (1-f) x (150 $\mu W/cm^2$). Taking the ratio of new to old average power one has

$$\text{Increase in average power per vehicle in traffic} = 2.35/[(1-f)+f/187.5] \quad \text{(a)}$$

For f = 0.5 the increase is a factor 4.7 while for f = 1 it is 440. If the initial market penetration fraction is represented by $M_0 \sim 0.001$ (see Toyota comments of 8 October 2009), then, relative to a future situation when M = 1, the total average radar power emitted by the vehicle fleet as a whole will increase by

$$\text{Increase in fleet total average power} = (2.35/M_0)\ /[(1-f)+f/187.5] \quad \text{(b)}$$

This would be a factor of a few thousand for f = 0.5 and $M_0 \sim 0.001$. On this basis NRAO cannot understand or accept the claim made by the FCC in ¶6 of the NPRM to the effect that "… changes in power levels and use suggested by TMC and Era will not result in any increased potential of interference to licensed services."

Respectfully submitted,
National Radio Astronomy Observatory

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